

۱۷, ۲۵

Note: راهنما در بعضی سوالات ترتیب اولویت ۱ و ۲ و ... مشخص شده. علی رخشانی فرکانس ۱۲ Date: / /

$$\textcircled{1} \frac{a \sin \frac{\pi}{3} + b \sin \frac{\pi}{3}}{a \sin \frac{\pi}{3} + b \cos \frac{\pi}{3}} \rightarrow (b \cos \frac{\pi}{3} = b \sin \frac{\pi}{3})$$

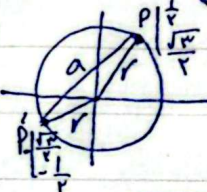
$$\downarrow$$

$$(\sin \frac{11\pi}{6} = \sin \frac{\pi}{6}) = \frac{1}{2}$$

$$\textcircled{2} \frac{(a+b)(\frac{\sqrt{3}}{2})}{(-a+b)(\frac{1}{2})} = \frac{-\sqrt{3}}{2} \quad \textcircled{3} \frac{a+b}{-a+b} = \frac{1}{\sqrt{3}} \quad \begin{matrix} 2a+2b = -a+b \\ 3a = -b \end{matrix}$$

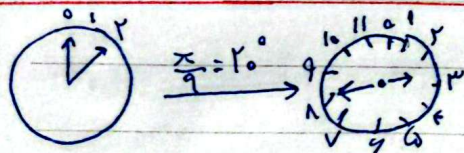
$$\frac{b}{a} = -3$$

$$\textcircled{1} P(\frac{1}{2}, \frac{\sqrt{3}}{2}) \Rightarrow \cos P = \frac{1}{2} \Rightarrow P = 60^\circ$$

$$\textcircled{2} P - 110^\circ = -150^\circ = 110^\circ$$


$$\textcircled{3} a = \sqrt{(\frac{1}{2} + \frac{\sqrt{3}}{2})^2 + (\frac{\sqrt{3}}{2} + \frac{1}{2})^2} = \sqrt{2(\frac{1}{4} + \frac{\sqrt{3}}{2} + \frac{3}{4})} = \sqrt{2 + \sqrt{3}}$$

$$\sin \alpha = \sqrt{2 + \sqrt{3}} + 2$$



۲۵۴۰

$$\textcircled{1} \alpha = \left| \frac{11M}{r} - 30H \right| \quad \textcircled{2} \gamma_0 = \left| \frac{11}{r}M - 30 \times (r) \right|$$

$$\textcircled{3} \begin{cases} \gamma_0 = \frac{11}{r}M - 90 \\ \gamma_0 = 90 - \frac{11}{r}M \end{cases} \quad \begin{matrix} 110 = \frac{11}{r}M \\ M = 10 \\ M = \frac{110}{11} \end{matrix} \rightarrow \text{دقتی لازم}$$

$$\textcircled{1} \Rightarrow -1 \leq \sin x \leq \frac{1}{2} \quad \textcircled{2} -1 \leq \frac{m-3}{a} \leq \frac{1}{2}$$

$$\textcircled{3} -a \leq m-3 \leq \frac{a}{2} \rightarrow -2 \leq m \leq a/2$$

$$-\frac{a}{2} < m-3 \leq a \rightarrow \frac{1}{2} < m \leq 1$$

① $\sin(180^\circ) = \cos(180^\circ)$

$\cos(180^\circ) = -\sin(180^\circ)$

$\cos(190^\circ) = -\cos(10^\circ)$

$\sin(190^\circ) = -\sin(10^\circ)$

② $\frac{\cos(10^\circ) + k(-\sin(10^\circ))}{-\cos(10^\circ) - r\sin(10^\circ)} = r$

$\frac{\cos 10^\circ - k\sin 10^\circ}{-\cos 10^\circ - r\sin 10^\circ} \div \cos 10^\circ \rightarrow \frac{1 - k\tan 10^\circ}{-1 - r\tan 10^\circ} = r \rightarrow \frac{1 - \frac{k}{2}}{-1 - \frac{1}{2}} = r$

$1 - \frac{k}{2} = -r - \frac{r}{2} \rightarrow -\frac{k}{2} = -\frac{1}{2} \rightarrow k = 1$

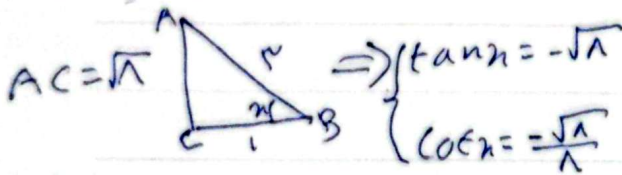
10:2

③ $-r\cos t - r\sin t = \cos t + k\sin t \rightarrow -r\cos t = (k+r)\sin t$

④ $-r = \frac{1}{r}(k+r) \rightarrow -1 = k+r \rightarrow k = -1-r$

① $\frac{\tan(\frac{\pi}{4} - n) - \cot(\pi - n)}{\cot(\frac{\pi}{4} - n) + r\tan(\pi - n)} = \frac{\cot n + \cot n}{\tan n - r\tan n}$

② $1 - \cos n = r + r\cos n \rightarrow \cos n = -\frac{1}{r}$



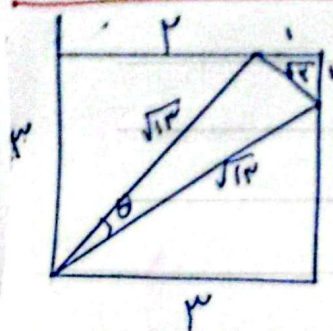
③ $\frac{-\frac{r\sqrt{2}}{1}}{\frac{1}{\sqrt{2}}} = -\frac{1}{r}$

① $\frac{1}{10} \times \frac{\pi}{10} = \frac{r}{10} \times \pi \rightarrow r = 1$

② $\frac{1}{10} \times \pi \times R = \frac{r}{10} \times \pi \times R^2 \rightarrow r = \frac{1}{R}$

① $AD = r \rightarrow AB = \sqrt{r} \rightarrow S = \frac{AB \times BC}{2} = \sqrt{r} \rightarrow r = 1$

③ $\sin C = \frac{r}{\sqrt{r}} \times \frac{r}{\sqrt{r}} = \frac{r}{\sqrt{r}}$



① $S_{\text{area}} = S_{\text{area}} - 1 - r = 4 - r = r$

② $\frac{1}{r} \times \sin \theta \times 1^2 = 1$

$\sin \theta = \frac{r}{1}$

سوال ۱۰

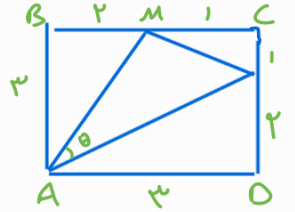
$$AN = AM \rightarrow AM^2 = (AB)^2 + (BM)^2 = 2^2 + 1^2 = 5 \rightarrow AM = \sqrt{5}$$

$$S_{AON} = S_{ABM} = \frac{2 \times 2}{2} = 2, \quad S_{MCN} = \frac{1 \times 1}{2}$$

$$\cancel{S_{AON}} + \cancel{S_{ABM}} + \cancel{S_{MCN}} + S_{AMN} = \cancel{S_{ABCD}} \rightarrow$$

$$\frac{1}{2} \times \sqrt{5} \times \sqrt{5} \times \sin \theta = \frac{2}{2}$$

$$\sin \theta = \frac{2}{5}$$



سوال ۸



$$L = \alpha r$$

$$2A = LB \rightarrow \frac{1 \cdot 1 \pi}{1 \cdot 1} \times r_A = \frac{4 \pi}{1} \times r_B \rightarrow r_A = \frac{4}{\pi} r_B$$

$$\frac{S_A}{S_B} = \left(\frac{r_A}{r_B} \right)^2 = \frac{16}{\pi^2}$$